

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Appellant:	Basir et al.	Group Art Unit:	3663
Serial No.:	10/783,390	Examiner:	Gooden, Jr., Barry J.
Filed:	02/20/2004	Confirmation No.:	6422
Title:	ADAPTIVE VISUAL OCCUPANT DETECTION AND CLASSIFICATION SYSTEM		

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

**REPLY BRIEF**

The Examiner's Answer withdrew all of the existing rejections and gave new grounds of rejection. More specifically, the Examiner switched the primary and secondary references in the obviousness rejections (i.e. Christl and Kung). Thus, although this renders some of the Argument section of Appellant's Appeal Brief moot, it seems practical to maintain the appeal and respond to the new grounds of rejection here.

**REVISED GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL**

Appellant seeks review of the following grounds of rejection:

- I. Claims 1-9, 14, 25-29 and 32-38 have been rejected as obvious over Christl (US 20040176891) in view of Kung (US 5,850,470).
- II. Claims 10-13, 30 and 31 have been rejected as obvious over Christl in view of Kung and further in view of Baloch (US 645997).

## **ARGUMENTS**

I. Claims 1-9, 14, 25-29 and 32-38 have been rejected as obvious over Christl (US 20040176891) in view of Kung (US 5,850,470).

### **Christl**

Christl does not disclose classifying a person based upon a spatial feature matrix. Christl does classify an occupant, but not based upon a spatial feature matrix. The invention of Christl relates to “transitional probabilities,” i.e. the probability that one classification will suddenly change to another. For example, it is likely that a classification of “adult” could change to “empty seat,” but very unlikely that a classification of “adult” could change suddenly to “child seat” without first changing to “empty seat.” [0055 of Christl]. The table in paragraph [0054] gives the transitional probabilities from one state (empty, adult, child seat) to another. There are no “spatial features” in the table, just transitional probabilities, so it is not a “spatial feature matrix” as claimed. The Examiner does admit that Christl does not disclose “dividing the image into subimages of different predetermined spatial regions” and “generating a spatial feature matrix of the image based upon the plurality of subimages.” Christl merely mentions that the classification system could be optical, but this has nothing to do with the transitional probability table, which could be applied to any type of classification sensors.

### **Kung**

Kung discloses a “Neural Network for Locating and Recognizing a Deformable Object.” The specific “deformable object” to which the Kung invention is directed is the human face. In other words, Kung provides a face recognition system. The Kung face detection system is intended to be used for “finding and identifying a specific but locally deformable pattern in an image, such as a human face.” (col. 1, lines 14-16). Face recognition is used for “person identification” such as for “ATM access, access control, surveillance and video conferencing.” (col. 1, lines 18-22). The entire disclosure of Kung is directed toward *identifying* a face as a

specific, known person in a database: “In any case, once the face has been located, the system then compares the face to other faces stored in the database in order to identify the person.” The Kung system cannot do anything with respect to a face that is not in the database

Claims 1-9, 14, 25-29, 32-33

First, Kung does not *classify* an occupant. Kung *identifies* a person (for example, for identifying a person accessing an ATM), *but only if that person is known in the database*. Kung provides no “classification” of the person. Therefore, even if Christl were somehow modified as proposed by the Examiner in view of Kung, the vehicle in Christl might be able to *identify* the driver for security purposes, but it would not meet the terms of claims 1 and 25.

All of the algorithms in Kung are directed toward comparing the face of the person with stored images in a database in order to identify a person. For example, Kung detects and compares the “eye coordinates,” eyebrows, nose, hairline and mouth. [col. 4, lines 44-54]. None of these teachings would be useful in *classifying* a person. In particular, none of these teachings would be used for *classifying* a person as “adult or child,” as recited in claim 1. Nor would these teachings be used for a classification such as “infant seat,” as recited in claim 25. Adults, children and infants all have eyes, eyebrows, noses, mouths and (often) hairlines, and Kung does not teach any distinction between these classifications based upon this information. Nor would these teachings be used to determine whether the occupant area is occupied, as recited in claim 34.

It would not be acceptable to include a system like Kung’s in a vehicle occupant classification system. It would not be useful to identify occupants because identifying them would not give any information relative to how the occupant safety systems should perform. In other words, having concluded that a specific individual is in the passenger seat of the vehicle, the system would still be unaware how to activate the vehicle safety system for that individual.

It would further be unacceptable to only be able to identify (or even somehow classify) only those occupants whose faces were previously stored in a database on that particular vehicle because the system would not work for guest passengers (even assuming that the owners of the

vehicle were willing and able to create and update a database of the faces of the regular occupants of the vehicle).

Claim 25

Additionally, claim 25 recites that the classifications include: infant seat. Kung's "face recognition" system does not determine whether an infant seat is present. The Examiner states that Christl discloses detecting an infant seat, but it is admittedly not done based upon "analyzing the low-level descriptors," as claimed.

Claim 32

Claim 32 depends from claim 1 and further recites "determining the classification of the occupant from among the classifications including: adult, child and infant seat." Again, Kung's face recognition system does not do this. The Examiner states that Christl does this, but Christl does not do this "based upon said step d)" i.e. analyzing the spatial feature matrix.

Claims 34-38

Claim 34 does not include the step of "classifying" discussed above with respect to independent claims 1 and 25 and claims dependent therefrom. Claim 34 recites, "determining whether the occupant area is occupied by a person based upon said step d)" i.e. "analyzing the spatial feature matrix." Kung does not have anything to do with an "occupant area in a vehicle" and does not relate to whether an occupant area of vehicle is occupied or not. It would not be logical to use a face recognition system that relies on a database of known faces in order to determine whether there is an empty seat in a vehicle.

Claim 35

Claim 35 depends from claim 34 and further recites "determining whether the person is an adult or a child." The Kung system does not do this. The Examiner simply states that Christl

determines whether the occupant is an adult or a child, but this has nothing to do with face recognition or analysis of a spatial feature matrix.

#### Claims 36-38

The Examiner merely states that the classifications and determinations of claims 36-38 are performed by Christl. However, all of these claims require that the classifications and determinations are “based upon analysis of the spatial feature matrix.” Since the Examiner admits that Christl does not disclose analysis of a spatial feature matrix, Christl does not perform the features of claims 36-38. Kung’s face recognition system would not perform these features either.

II. Claims 10-13, 30 and 31 have been rejected as obvious over Christl in view of Kung and further in view of Baloch (US 645997).

#### Claims 10 and 30

Claims 10 and 30 recite, “altering the orientation or the location from which the image is captured and adjusting the system parameters.” The Examiner argues that this is shown in Baloch, but (whether or not it is), this does not make sense in the Examiner’s proposed Christl/Kung system. Kung is a face recognition system. There are no “orientations” or “locations” to alter and no “system parameters” to adjust because the Kung system must be looking at the face to be identified.

**CLOSING**

For the reasons set forth above, the final rejection of all claims is improper and must be reversed. An early indication of such is earnestly solicited.

Respectfully submitted,

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